

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of Claims:

1 - 55. (Cancelled)

56. (Currently Amended) An atomic layer deposition (ALD) apparatus, comprising:
a reaction chamber having a wafer support disposed therein, said reaction chamber being
coupled between downstream of a set of ALD chemical precursor sources and a first purge gas
flow pathway, and a second gas flow pathway, the first gas flow pathway coupled said reaction
chamber being coupled upstream of a pumping arrangement that includes a controllable flow
conductance and a pump; and

a second purge gas flow line, independent of the chemical precursor sources, placed in
parallel with the ALD chemical precursor sources through a gas distribution apparatus disposed
within the reaction chamber, said second, independent purge gas flow line being placed
downstream from an inert gas source through both low conductance and high conductance gas
flow pathways and having switchable first and second flow limiting conductances, and the
second gas flow pathway coupled downstream of the reaction chamber and characterized by a
downstream flow limiting conductance switchable under the control of a control system
configured to operate the downstream flow limiting conductance to maintain a nominally
constant ratio of a conductance of the first gas flow pathway to a conductance of the second gas
flow pathway under varying gas flow conditions.

57 - 60. (Cancelled)

61. (Currently Amended) The ALD apparatus of claim 56, wherein ~~the~~ the downstream
controllable flow limiting conductance is switchable from a first state to a second state ~~at a~~
~~different point in time than that at which the first gas flow condition is switched to the second~~
~~gas flow condition.~~

62 - 63. (Cancelled)

64. (Currently Amended) The ALD apparatus of claim 56, wherein the downstream controllable flow limiting conductance comprises a throttle valve.

65. (Previously Presented) The ALD apparatus of claim 64, wherein the throttle valve comprises an annular throttle valve located within the reaction chamber.

66. (Previously Presented) The ALD apparatus of claim 65, wherein the annular throttle valve includes multiple vanes, each having an axis therethrough.

67. (Previously Presented) The ALD apparatus of claim 65, wherein the annular throttle valve includes multiple blades arranged in an iris configuration.

68. (Previously Presented) The ALD apparatus of claim 65, wherein the annular throttle valve includes multiple blades, each having a number of holes therethrough, at least one of the blades being rotatable about an axis such that holes extending through the rotatable blade align with holes of at least one of the other blades to provide a passage through the annular throttle valve.

69. (Cancelled)

70. (Currently Amended) The ALD apparatus of claim 56, wherein the controllable downstream flow limiting conductance is switchable under the control of ~~the~~ a controller to switch states according to a difference in residence times for passage of gas between (i) ~~the first gas flow pathway upstream gas sources~~ and the reaction chamber, and (ii) the reaction chamber and the controllable downstream flow limiting conductance.

71 - 74. (Cancelled)

75. (New) The ALD apparatus of claim 56, wherein the controllable flow conductance is switchable under the control of a controller to switch states to maintain a nominally constant ratio between (i) gas flow pathway conductances upstream of the reaction chamber, and (ii) gas flow pathway conductances downstream of the reaction chamber during both exposure and purge periods of an ALD cycle.

76. (New) An atomic layer deposition (ALD) apparatus, comprising:

a reaction chamber having a wafer support disposed therein, said reaction chamber being coupled downstream of a set of ALD chemical precursor sources and a first purge gas flow pathway, and said reaction chamber being coupled upstream of a pump stack that includes a controllable flow conductance and a pump; and

a second purge gas flow line, independent of the chemical precursor sources, said second purge gas flow line being placed downstream from an inert gas source through both low conductance and high conductance gas flow pathways and being fed to the pump stack below the reaction chamber.